

What is claimed is:

1. A method for damping vibration of a substrate comprising the steps of:
providing a substrate;
mixing at least two components to form a liquid material, wherein the first component consists essentially of at least one amine-terminated polymer present in an amount sufficient to impart a predetermined amount of tensile strength, hardness and flexibility, and the second component consists essentially of at least one isocyanate compound, the first and second components reacting upon mixing; and
applying the liquid material to the substrate at ambient temperature.
2. The method as defined in claim 1 wherein the ambient environment has a temperature ranging between about 35°F (1.7°C) and about 160°F (71.1°C).
3. The method as defined in claim 2 wherein the ambient environment has a temperature ranging between about 50°F (10°C) and about 120°F (48.9°C).
4. The method as defined in claim 1 wherein the ambient environment has a pressure ranging between about 730 mm Hg and about 800 mm Hg.
5. The method as defined in claim 4 wherein the ambient environment has a pressure ranging between about 750 mm Hg and about 780 mm Hg.
6. The method as defined in claim 1 wherein the material cures in an interval ranging between about 2 seconds and about 30 minutes.
7. The method as defined in claim 6 wherein the material cures in an interval ranging between about 15 seconds and about 20 seconds.
8. The method as defined in claim 1 wherein the substrate is at least one of a metal stamping, a body in white, carbon graphite composites, fiberglass.

polycarbonates, ABS, and structural polymeric materials.

9. The method as defined in claim 8 wherein the substrate is a body in white.

10. The method as defined in claim 1 wherein the applying step is performed by at least one of spraying, dipping and brushing.

11. The method as defined in claim 10 wherein the applying step is performed by a high pressure, impingement mix spray system.

12. The method as defined in claim 9 wherein the vibration damped includes at least one of noise, vibration and harshness.

13. A method for damping vibration of a substrate comprising the steps of:
providing a substrate;
mixing at least two components to form a liquid material, wherein the first component consists essentially of at least one polyoxalene polymer present in an amount sufficient to impart a predetermined amount of tensile strength, hardness and flexibility, and the second component consists essentially of at least one isocyanate compound, the first and second components reacting upon mixing; and
applying the liquid material to the substrate at ambient temperature.

14. The method as defined in claim 13 wherein the first component further consists essentially of:

at least one chain extender present in an amount sufficient to impart a predetermined amount of tensile strength, weatherability, flexibility, adhesion to specific substrates, and hardness; and

at least one filler present in an amount sufficient to impart a predetermined amount of hardness, flexibility, and specific vibration blocking characteristics to the

substrate.

15. The method as defined in claim 14 wherein the first component further consists essentially of:

a colorant compound selected from the group consisting of carbon black, titanium dioxide, iron oxide, organic pigments, dyes, and mixtures thereof; and

a catalyst selected from the group consisting of tertiary amines, organometallic catalysts, and mixtures thereof.

16. The method as defined in claim 13 wherein the at least one polyoxalene polymer is selected from the group consisting of polyoxypropylene diols, polyoxypropylene triols, di-, tri-, quad- or penta-functional polyester polyols, di-, tri-, quad- or penta-functional polyether polyols, and mixtures thereof.

17. The method as defined in claim 13 wherein the isocyanate compound consists essentially of isocyanate quasi-prepolymers based on a uretonimine modified MDI and a high molecular weight polyether polyol having an isocyanate content of about 15.8% and a 2,4'-isomer content of less than about 10%.

18. The method as defined in claim 13 wherein the second component further consists essentially of at least one plasticizer present in an amount sufficient to impart a predetermined amount of flexibility.

19. The method as defined in claim 18 wherein the plasticizer consists essentially of alkylene carbonates selected from the group consisting of ethylene carbonates, propylene carbonates, butylene carbonates, dimethyl carbonates, and mixtures thereof.

20. A method for damping vibration of a substrate comprising the steps of:
providing a substrate;

mixing at least two components to form a liquid material, the first and second components reacting upon mixing;

wherein the first component consists essentially of at least one amine terminated polyoxalene polymer present in an amount sufficient to impart a predetermined amount of tensile strength, hardness and flexibility, and the second component consists essentially of at least one isocyanate compound having at least one-NCO radical reactive with the first component; and

applying the liquid material to the substrate at ambient temperature, the liquid material cures substantially instantaneously.

21. The method as defined in claim 20 wherein the further consists essentially of:

at least one chain extender selected from the group consisting of dialkyl substituted methylene dianilines, diethyltoluene diamines, and mixtures thereof; and

at least one filler is selected from the group consisting of barium sulfate, calcium carbonate, clay, talc, aluminum silicate, titanium dioxide, nitrile rubbers, butyl rubbers, synthetic rubbers, chopped fiberglass, calcium metasilicate, fibers, fumed silica, and mixtures thereof.

22. The method as defined in claim 20 wherein the amine terminated polyoxalene polymer has a molecular weight between about 1000 and about 6000.

23. The method as defined in claim 20 wherein the first component of the composition further consists essentially of at least one adhesion promoter, wherein the adhesion promoter comprises an organosilane compound.

24. A method for damping vibration of a substrate, the substrate being at least one of a metal stamping, a body in white, carbon graphite composites, fiberglass, polycarbonates, ABS, and structural polymeric materials, the method comprising the step of:

applying substantially organic a liquid material by at least one of spraying, dipping and brushing onto the substrate in an ambient environment, the ambient environment having a temperature ranging between about 35°F (1.7°C) and about 160°F (71.1°C), wherein, after application to the substrate, the material cures in an interval ranging between about 15 seconds and about 20 seconds;

wherein the substantially organic liquid material consists essentially of:

a first component, consisting essentially of at least one polymer present in an amount sufficient to impart a predetermined amount of tensile strength, hardness and flexibility; and

a second component, consisting essentially of at least one isocyanate compound and is reactive with the first component.

25. The method as defined in claim 24 wherein the first component of the liquid material consists essentially of:

at least one polymer present in an amount sufficient to impart a predetermined amount of tensile strength, hardness and flexibility;

at least one chain extender present in an amount sufficient to impart a predetermined amount of tensile strength, weatherability, flexibility, adhesion to specific substrates, and hardness; and

at least one filler present in an amount sufficient to impart a predetermined amount of hardness, flexibility, and specific vibration blocking characteristics to the substrate.

26. The method as defined in claim 25 wherein the at least one polymer is selected from the group consisting of polyoxypropylene diols, polyoxypropylene triols, di-, tri-, quad- or penta-functional polyester polyols, di-, tri-, quad- or penta-functional polyether polyols, and mixtures thereof.

27. The method as defined in claim 26 wherein the isocyanate compound consists essentially of isocyanate quasi-prepolymers based on a uretonimine modified

MDI and a high molecular weight polyether polyol having an isocyanate content of about 15.8% and a 2,4'-isomer content of less than about 10%.

28. The method as defined in claim 27 wherein the second component further consists essentially of at least one plasticizer present in an amount sufficient to impart a predetermined amount of flexibility.

29. The method as defined in claim 28 wherein the plasticizer consists essentially of alkylene carbonates selected from the group consisting of ethylene carbonates, propylene carbonates, butylene carbonates, dimethyl carbonates, and mixtures thereof.

30. The method as defined in claim 25 wherein the at least one polymer comprises amine-terminated polyoxypropylene diols of about 2000 molecular weight;

wherein the at least one chain extender is selected from the group consisting of dialkyl substituted methylene dianilines, diethyltoluene diamines, and mixtures thereof; and

wherein the at least one filler is selected from the group consisting of barium sulfate, calcium carbonate, clay, talc, aluminum silicate, titanium dioxide, nitrile rubbers, butyl rubbers, synthetic rubbers, chopped fiberglass, calcium metasilicate, fibers, fumed silica, and mixtures thereof.

31. The method as defined in claim 30 wherein the first component further consists essentially of:

a colorant compound selected from the group consisting of carbon black, titanium dioxide, iron oxide, organic pigments, dyes, and mixtures thereof; and

a catalyst selected from the group consisting of tertiary amines, organometallic catalysts, and mixtures thereof.

32. The method as defined in claim 31 wherein the first component of the composition further consists essentially of at least one adhesion promoter, wherein the adhesion promoter comprises epoxy silane compounds.